# Contents Volume 188 (1997)

**Differential response of rye, triticale, bread and durum wheats to zinc deficiency in calcareous soils**
I. Cakmak, H. Ekiz, A.Yilmaz, B. Torun, N. Köleli, I. Gültekin, A. Alkan, S. Eker **1–10**

**Edaphic influences on a New Zealand ultramafic ("serpentine") flora: a statistical approach**
B.H. Robinson, R.R. Brooks, J.H. Kirkman, P.E.G. Gregg, H.V. Alvarez **11–20**

**Development of a boron buffered solution culture system for controlled studies of plant boron nutrition**
A. Asad, R.W. Bell, B. Dell, L. Huang **21–32**

**Application of plant growth-promoting rhizobacteria to soybean (*Glycine max* [L.] Merr.) increases protein and dry matter yield under short-season conditions**
N. Dashti, F. Zhang, R. Hynes, D.L. Smith **33–41**

**Green manures of oat, rape and sweet corn for reducing common root rot in pea (*Pisum sativum*) caused by *Aphanomyces euteiches***
J.L. Williams-Woodward, F.L. Pfleger, V.A. Fritz, R.R. Allmaras **43–48**

**Effects of cattle slurry and mineral N fertilizer applications on various components of the nitrogen balance of mown grassland**
J.M. Estavillo, M. Rodríguez, M. Lacuesta, C. González-Murua **49–58**

**Rhizosphere soil-water collection by immiscible displacement-centrifugation technique**
H.T. Gollany, P.R. Bloom, T.E. Schumacher **59–64**

**Phenotypic characteristics and composition of rhizobia associated with woody legumes growing in diverse Kenyan conditions**
D.W. Odee, J.M. Sutherland, E.T. Makatiani, S.G. McInroy, J.I. Sprent **65–75**

**A study of the symbiotic importance and location of *nod* gene inducing compounds in two widely nodulating and two non-nodulating tropical tree species**
J.E. Shaw, T. Reynolds, J.I. Sprent **77–82**

**Water accessibility to plant roots in different soil structures occurring in the same soil type**
P. Droogers, F.B.W. van der Meer, J. Bouma **83–91**

**Procedures to enhance heat resistance of *Rhizobium***
A.H. AbdelGadir, M. Alexander **93–100**

**Productivity in Great Plains acid soils of wheat genotypes selected for aluminium tolerance**
J.P. Johnson, Jr., B.F. Carver, V.C. Baligar **101–106**

**Site preparation alters soil distribution of roots and ectomycorrhizae on outplanted western white pine and Douglas-fir**
A.E. Harvey, D.S. Page-Dumroese, M.F. Jurgensen, R.T. Graham, J.R. Tonn **107–117**

**Nitrogen loss from grassland on peat soils through nitrous oxide production**
J.G. Koops, M.L. van Beusichem, O. Oenema **119–130**

**Effect of potassium nutrition of rice on rhizosphere redox status**
J. Chen, J. Xuan, C. Du, J. Xie **131–137**

***SimRoot*: Modelling and visualization of root systems**
J.P. Lynch, K.L. Nielsen, R.D. Davis, A.G. Jablokow **139–151**

**Heavy metal uptake and chemical changes in the rhizosphere of *Thlaspi caerulescens* and *Thlaspi ochroleucum* grown in contaminated soils**
S.P. McGrath, Z.G. Shen, F.J. Zhao **153–159**

**Maximum axial growth pressures of the lateral roots of pea and eucalypt**
R.K. Misra **161–170**

**Al-induced inhibition of root elongation in corn, *Zea mays* L. is overcome by Si addition**
J.F. Ma, M. Sasaki, H. Matsumoto **171–176**

**Effect of nitrogen nutrition on the export of sulphur from leaves in soybean**
Sunarpi, J.W. Anderson **177–187**

**Effects of the previous shoot removal frequency on subsequent shoot regrowth in two *Medicago sativa* L. cultivars**
J.C. Avice, G. Lemaire, A. Ourry, J. Boucaud **189–198**

**Mycorrhizal fungi influence plant and soil functions and interactions**
R.P. Schreiner, K.L. Mihara, H. McDaniel, G.J. Bethlenfalvay **199–210**

**Mineralisation of nitrogen from and incorporated catch crop at low temperatures: experiment and simulation**
L. Van Schöll, A.M. Van Dam, P.A. Leffelaar **211–219**

**Mycorrhizal inoculation of cloned hazels by *Tuber melanosporum*: effect of soil disinfestation and co-culture with *Festuca ovina***
M. Mamoun, J.M. Oliver **221–226**

**Effect of shade on the growth and mineral nutrition of a $C_4$ perennial grass under field conditions**
P. Cruz **227–237**

**Silicon deficiency and the adaption of tropical rice ecotypes**
M.D. Winslow, K. Okada, F. Correa-Victoria **239–248**

**Response of wheat genotypes to sowing date and boron fertilization aimed at controlling sterility in a rice-wheat rotation in Nepal**
K.D. Subedi, C.B. Budhathoki, M. Subedi, D. Yubak **249–256**

**The persistence of bioluminescent *Rhizobium melioti* strains L1 (RecA$^-$) and L33 (RecA$^+$) in non-sterile microcosms depends on the soil type, on the co-cultivation of the host legume alfalfa and on the presence of an indigenous *R. meliloti* population**
M. Hagen, A. Pühler, W. Selbitschka **257–266**

**Influences of different nitrate to ammonium ratios on chlorosis, cation concentrations, and the binding forms of Mg and Ca in needles of Mg-deficient Norway spruce**
B. Mehne-Jakobs, M. Gülpen **267–277**

**Phosphorus uptake by root systems: mathematical modelling in *ecosys***
R.F. Grant, J.A. Robertson **279–297**

**Carbon and nitrogen allocation in *Lolium perenne* in response to elevated atmospheric $CO_2$ with emphasis on soil carbon dynamics**
J.H. van Ginkel, A. Gorissen, J.A. van Veen **299–308**

**Chlorsulfuron reduces rates of zinc uptake by wheat seedlings from solution culture**
M. Wheal, Z. Rengel **309–317**

**Root and inorganic nitrogen distributions in sesbania fallow, natural fallow and maize fields**
K. Mekonnen, R.J. Buresh, B. Jama **319–327**

**Application of gibberellic acid to the surface of soybean seed (*Glycine max* (L.) Merr.) and symbiotic nodulation, plant development, final grain and protein yield under short season conditions**
F. Zhang, B. Pan, D.L. Smith **329–335**

**Volume contents** **337–339**

**Author index** **340**

**Instructions to authors (1997)** **341–343**